

OIL & WATER

Don't Mix...Except *in a* **GE F404**

By LCdr. Peter Matisoo

Here we go: Two night traps, and I'd be CQ complete. Overall, this looked to be a smooth-deck certification—not so fast!

No moon, and it was dark, but the deck was steady, and the weather was beautiful. I got my day traps, and the walk-on pilot hot-seated into my jet to “bag.” We planned to be efficient and hot-seat me back into the jet for my comfort time and two night traps.

I jumped in, and the previous pilot told me “no problems, good jet,” as the purpleshirts hooked up the fuel hose. Here's where the fun started. The jet had 4,000 pounds before they hooked-up the hose. The jet was almost a full 14,500 pounds when I received a G-LIM 7.5 caution, and the fuel quantity dropped to 11,700 pounds. I thought it was an SDC problem, so I checked the fuel format and discovered tank No. 1 indicated INV and tank No. 4 was EST.



I reset the SDC, but that move didn't help. The two probes in tank No. 1 and the forward and center probes in tank No. 4 displayed fluctuating and negative values. Why would the values in the transfer tanks Nos. 1 and 4 be affected and not the values in the engine-feed tanks Nos. 2 and 3?

“This is odd,” I thought. One of our sister squadron's aircraft parked next to me along the foul line also was having fuel-probe issues. “What's going on?” I wondered. I tried an SDC IBIT, and the SDC was “go.” It was time to



Photo by PHAN James Wagner, modified.

call a troubleshooter. We swapped SDCs, but that change did not help. We were out of ideas and at an impasse. We shut down and called the beach for guidance.

The ship had finished deck certification and planned to enter port early the next morning. If the jet did not fly off that night, it most likely would stay aboard the carrier until the ship pulled out a week later.

Tanks No. 1 and 4 indicated quantities within the normal transfer schedule, so there should not be a CG issue. We thought through the contin-

gencies, but I had a nagging feeling I was relying too much on my over 2,000 hours of Hornet experience. We decided to skip the CQ and do a one-time flight to NAF Atsugi, 110 miles away.

I manned-up the jet, and there had been no change to the Nos. 1 and 4 tank indications: The readings still were erroneous. I'd never seen anything like this before.

The cat shot was normal, at least as normal as a night cat shot can be. Passing 2,500 feet, I noticed the fuel indications were back to normal. I climbed to 10,500 feet for the return trip home,

and I thought, “Hey, it’s back to normal. I can turn around and finish CQ.”

However, common sense returned and I decided to stick with the plan. The soundness of my decision and the stupidity of my previous thought of finishing CQ was confirmed shortly thereafter when tank No. 1 indicated EST again. I definitely was heading home.

The dumps were on, and I adjusted down to 4,000 pounds to land. I wanted to strike a balance between landing with carrier-pressure tires and having enough gas to keep my options open, since the nearest divert was Hyakuri, a Japanese F-15 base 65 miles away. After an uneventful landing, I shut down, did the requisite paperwork, and headed home a thankful man.

When I arrived at the squadron the next morning, I stopped by maintenance control to see what they had found wrong with the jet. After I heard the news, I knew beyond the shadow of a doubt someone had been watching over me. The fuel samples contained approximately 40-percent saltwater. Apparently, one of the fuel tanks aboard the ship had been contaminated with saltwater, and the contamination had gone undetected. Of the other two Hornets at the carrier the previous night, the jet parked next to mine—the one also with fuel-probe problems—had contaminated fuel. The other Hornet was parked closer to the bow for refueling and did not use the same fueling station.

It seems the trusty GE F404 engine, which has been known to run after ingesting a rubber catapult-track cover, also runs on a mix of saltwater and JP-5. At least 4,000 pounds of uncontaminated fuel were in the engine-feed tanks, so I’m sure the saltwater-fuel mixture from the transfer tanks was diluted more than what was in the transfer tanks. Those motors did not cough or sputter once that night.

I asked myself, “What would have happened had the trip been long enough to have burned into the 40-percent-saltwater and 60-percent-JP-5 mixture?” I don’t think GE has a test point for that. Those who have flown around NAF Atsugi understand there are not a lot of places to jettison an airplane.

Beyond the obvious contamination of the fuel, what went wrong? We looked at what we perceived to be the risks at the time and decided they were acceptable, based on the information we had. We knew the tanks were full, because my initial indication was 14.5, and the fuel valves had closed off. We didn’t know something besides JP-5 was filling up those tanks. Taking fuel samples in response to erroneous fuel-probe indications is not a step in the maintenance manuals—but it soon will be. What we have here is the same lesson learned many times over: It’s what you don’t know that really can hurt you. That night, the circumstances were just right to escape a mishap. 🦅

LCdr. Matisoo flies with VFA-27.

